

FIG. 2

Investigator(s): William A. Curby et al.

THERMAL ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: Charcoal
Size: 0.0400 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

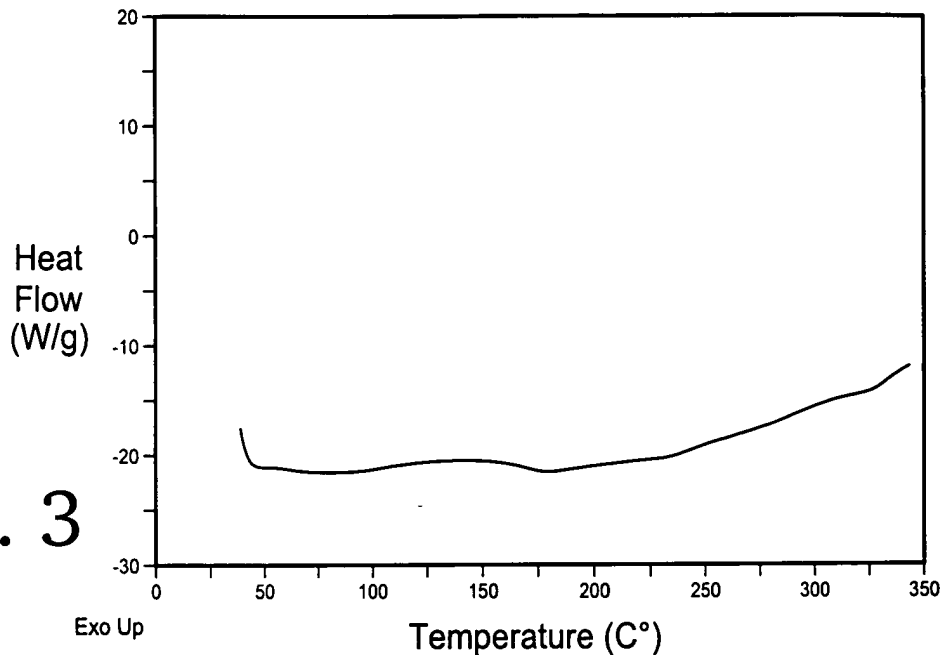


FIG. 3

DSC thermogram of charcoal, sample weight is 0.04 mg

Sample: Isopropanol
Size: 0.600 mg
Method: RT to 350°C at 20°C/min

DSC

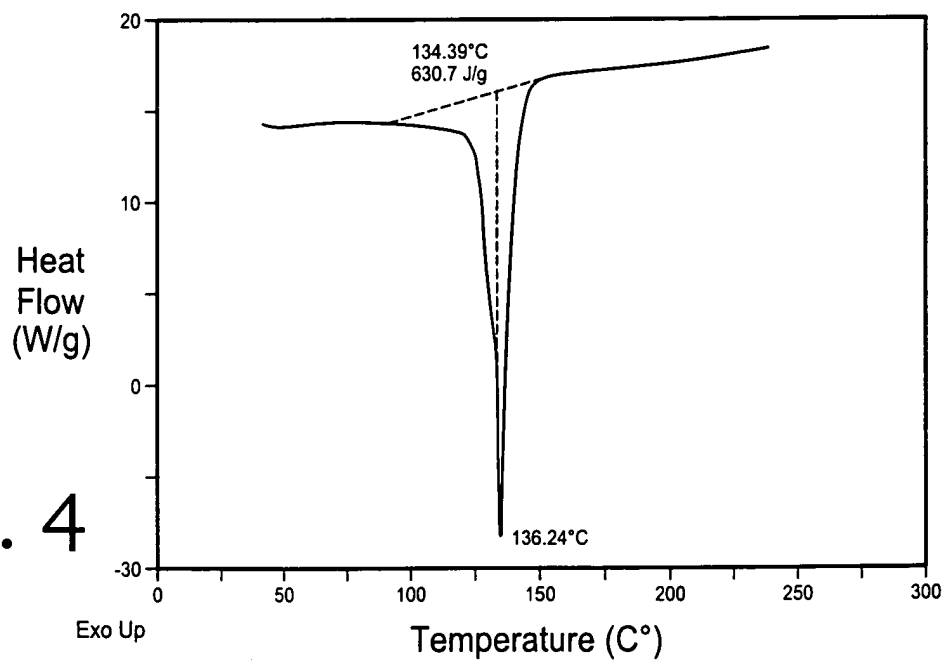


FIG. 4

Sample: C-4
Size: 0.3080 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

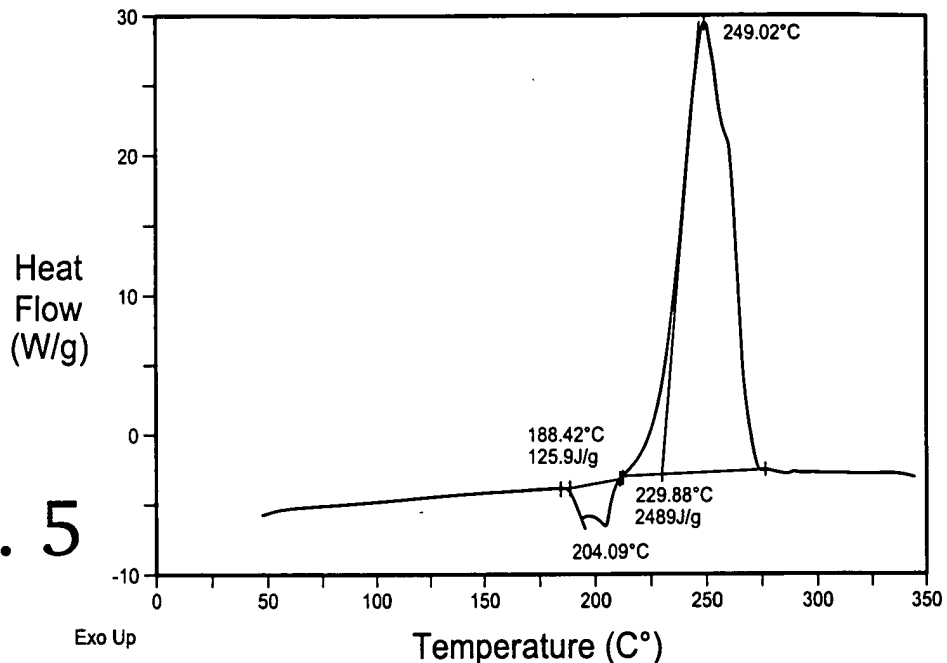


FIG. 5

DSC thermogram of C-4, sample weight is 0.308 mg

Sample: UMass HMTD
Size: 0.4400 mg
Method: 20°C/min RT-> 350°C
Comment: N2=50 mL/min

DSC

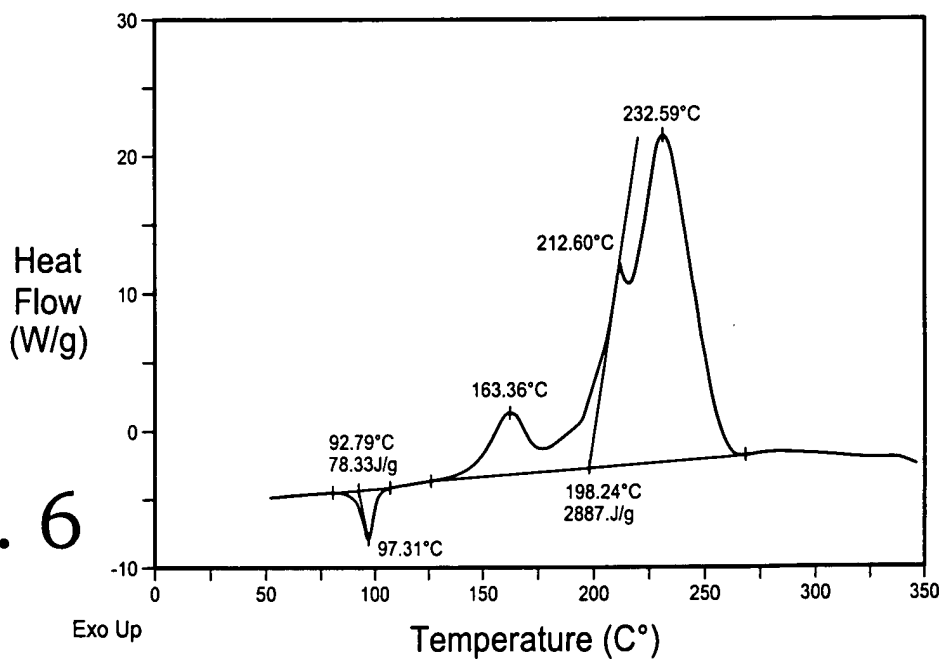


FIG. 6

DSC thermogram of HMTD, sample weight is 0.44 mg

Applicant(s): William A. Curby et al.

THERMAL ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: UMass DADP
Size: 0.6990 mg
Method: 20°C/min RT->350°C
Comment: N2=50 mL/min

DSC

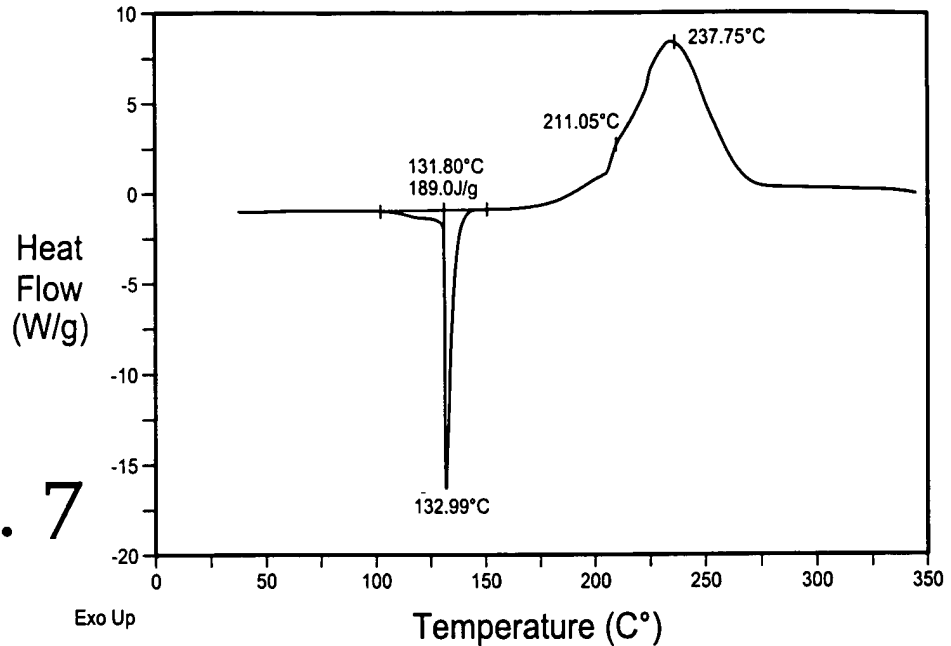


FIG. 7

DSC thermogram of DADP, sample weight is 0.699 mg

Sample: UMass HMTD
Size: 0.4400 mg
Method: 20°C/min RT-> 350°C
Comment: N2=50 mL/min

DSC

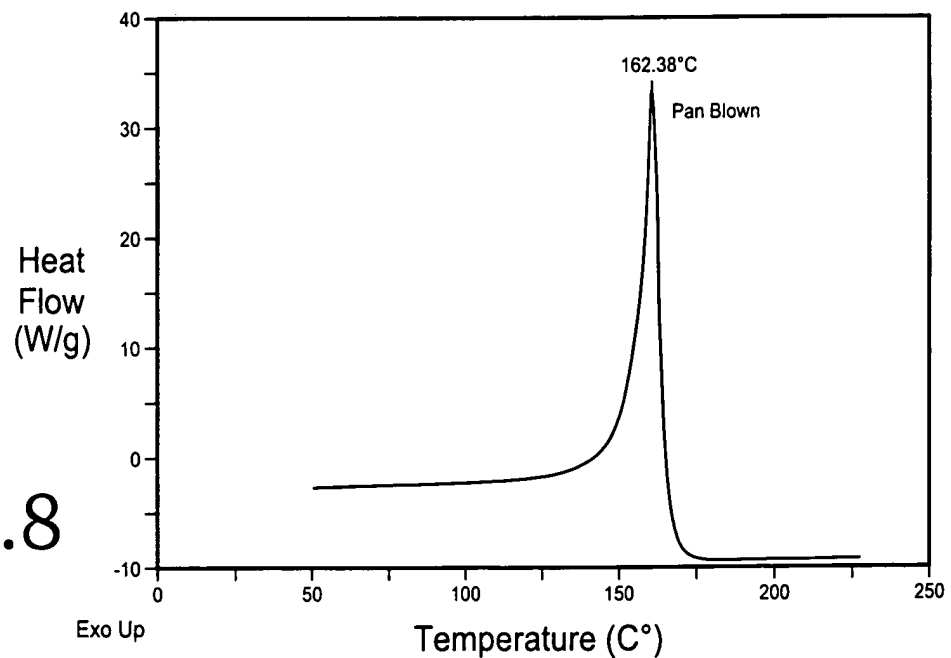


FIG. 8

DSC thermogram of HMTD, sample weight is 0.44 mg

Sample: UMass Ammonium Nitrate
Size: 0.0900 mg
Method: 20°C/min RT->400°C
Comment: N2=50 mL/min

DSC

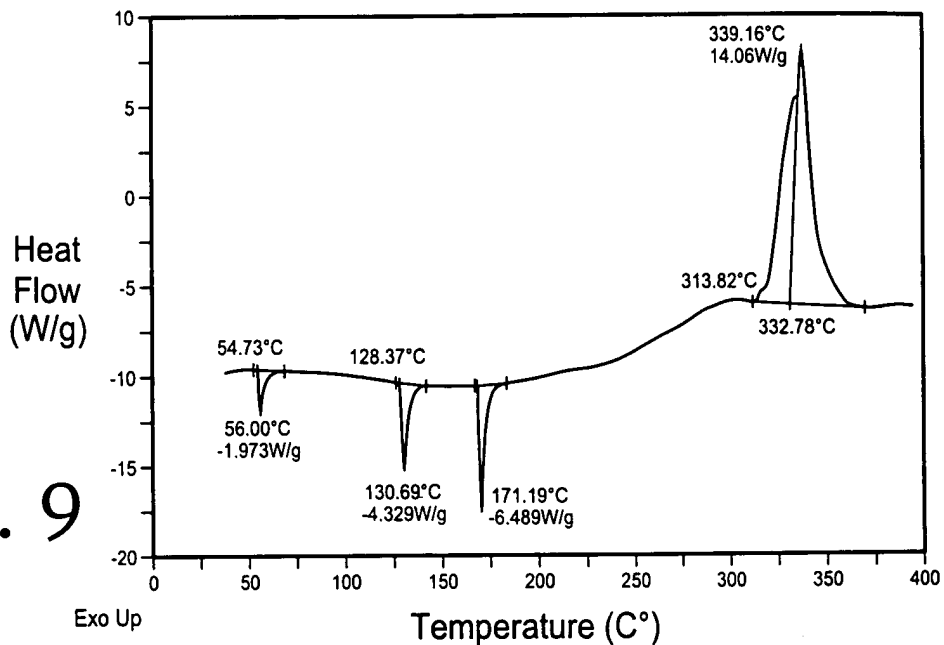


FIG. 9

DSC thermogram of Ammonium Nitrate, sample weight is 0.09 mg

Sample: UMass Urea Nitrate
Size: 0.2110 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

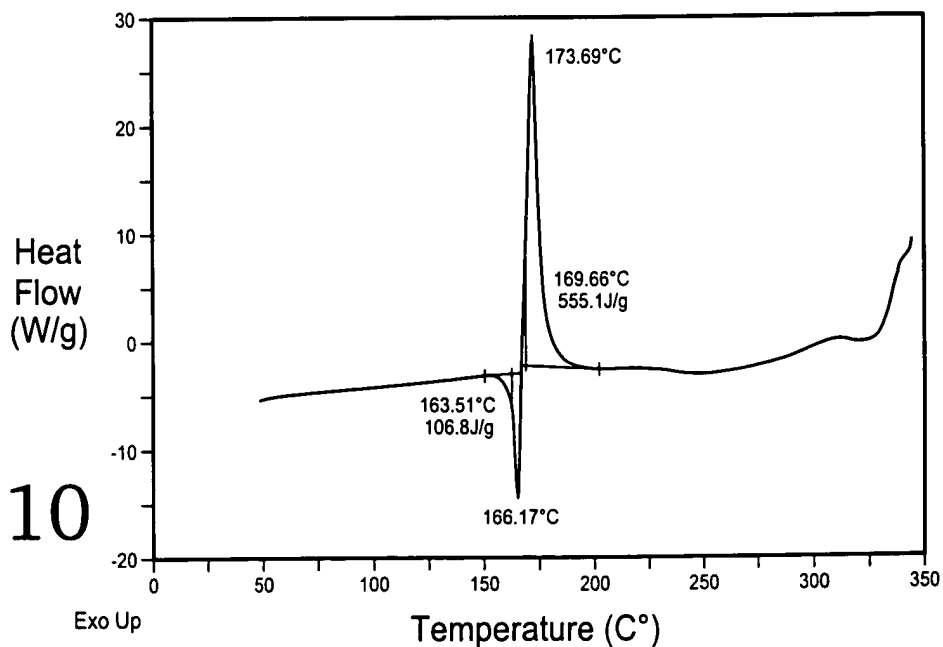


FIG. 10

DSC thermogram of Urea Nitrate, sample weight is 0.211 mg

Sample: Ammonium Perchlorate
Size: 0.444 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

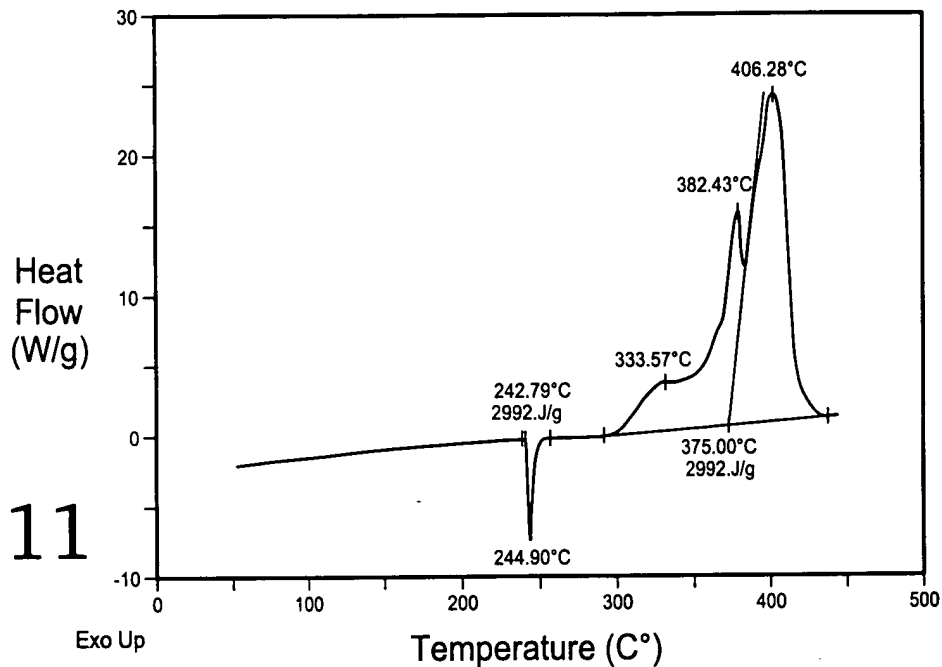


FIG. 11

DSC thermogram of Ammonium Perchlorate, sample weight is 0.444 mg

Sample: Benzoyl Peroxide
Size: 0.071mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

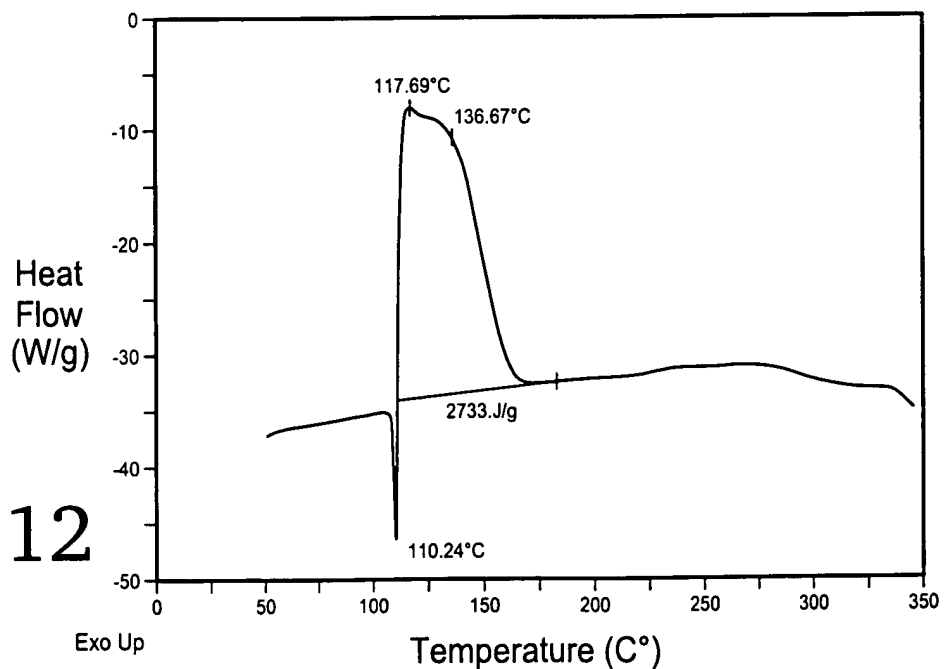


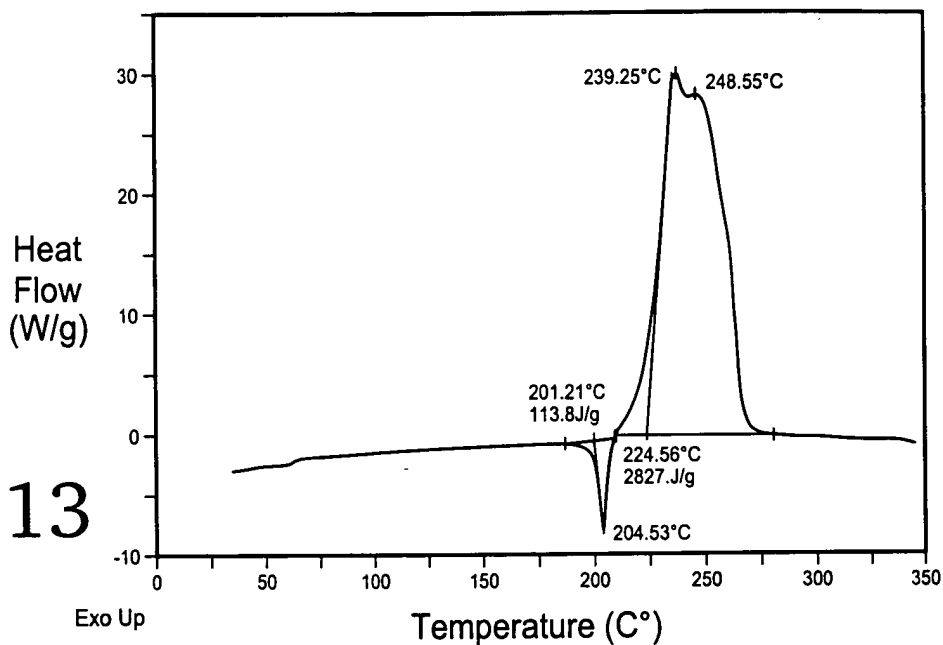
FIG. 12

DSC thermogram of Benzoyl Peroxide, sample weight is 0.071 mg

Sample: UMass RDX
Size: 0.4000 mg
Method: 20°C/min RT-> 350°C
Comment: N2=50 mL/min

DSC

FIG. 13

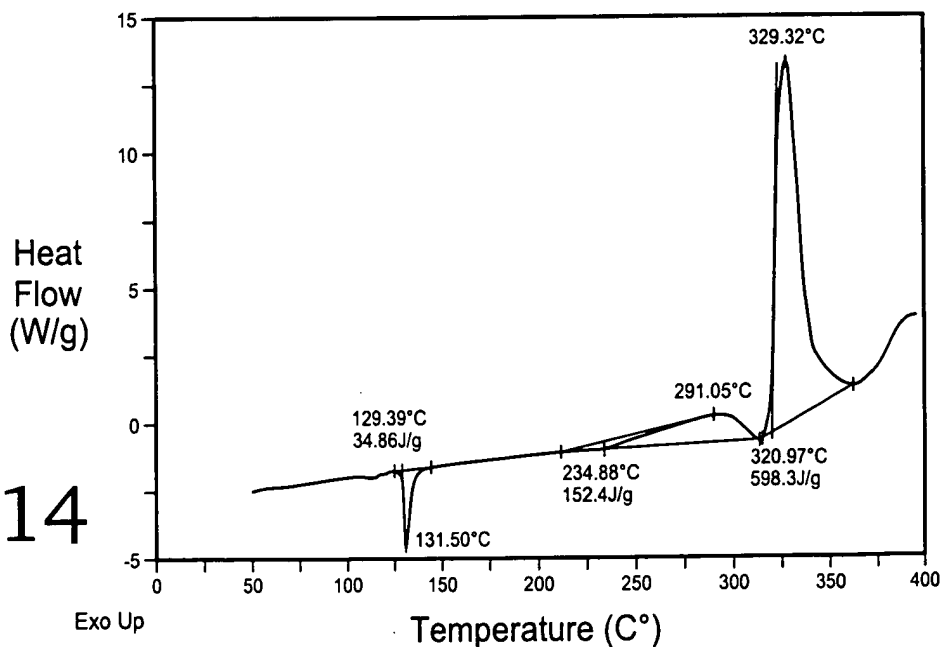


DSC thermogram of RDX, sample weight is 0.400 mg

Sample: UMass FFF9
Size: 0.4890 mg
Method: 20°C/min RT->350°C
Comment: N2=50 mL/min

DSC

FIG. 14



DSC thermogram of Black Powder, sample weight is 0.489 mg

Applicant(s): William A. Curby et al.
THERMAL ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: UMass Remington
Smokeless
Size: 0.0710 mg
Method: 20°C/min RT->350°C
Comment: N2=50 mL/min

DSC

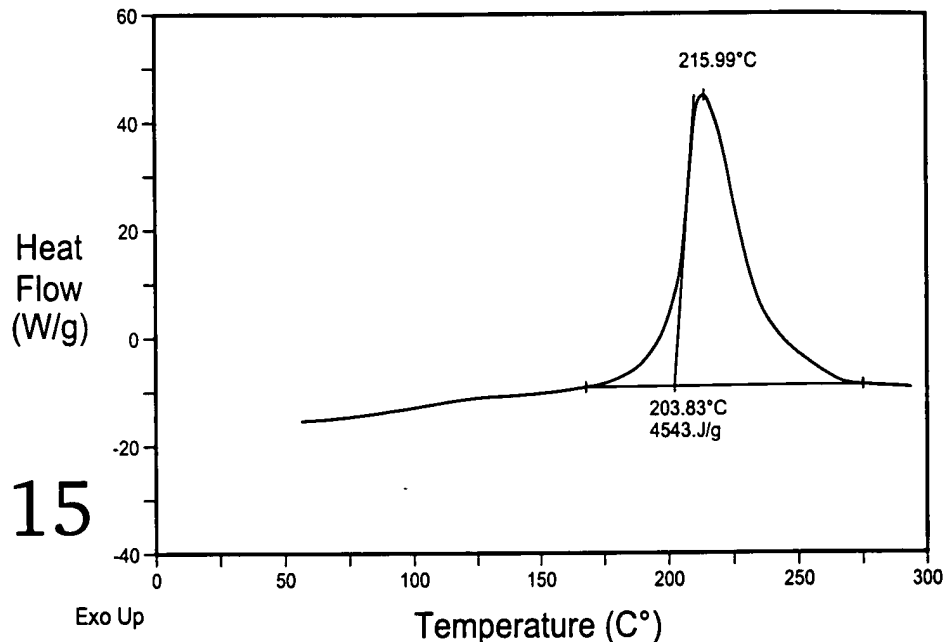


FIG. 15

DSC thermogram of Smokeless Remington,, sample weight is 0.071 mg

Sample: UMass Military Spec Ammo.
Size: 0.2150 mg
Method: 20°C/min RT-> 350°C
Comment: N2=50 mL/min

DSC

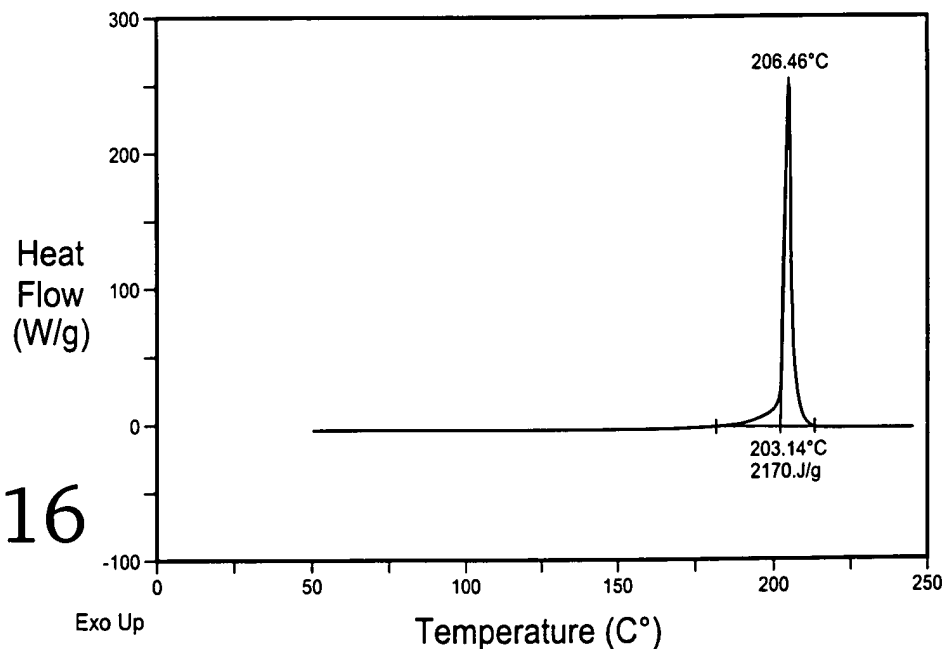


FIG.16

DSC thermogram of Mil. Spec. Ammo., sample weight is 0.215 mg

Sample: 2,3-Dimethyl-2,3-dinitrobutane
 Size: 0.1840 mg
 Method: 20°C/min
 Comment: N2=50 mL/min

DSC

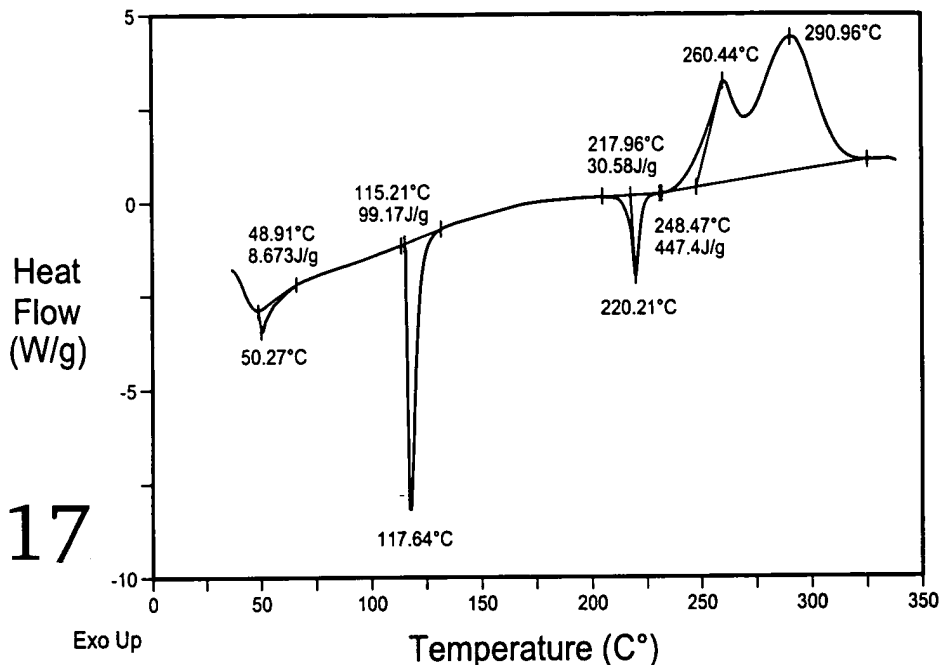


FIG. 17

DSC thermogram of 2,3-dimethyl-2,3-dinitrobutane,
 sample weight is 0.184 mg

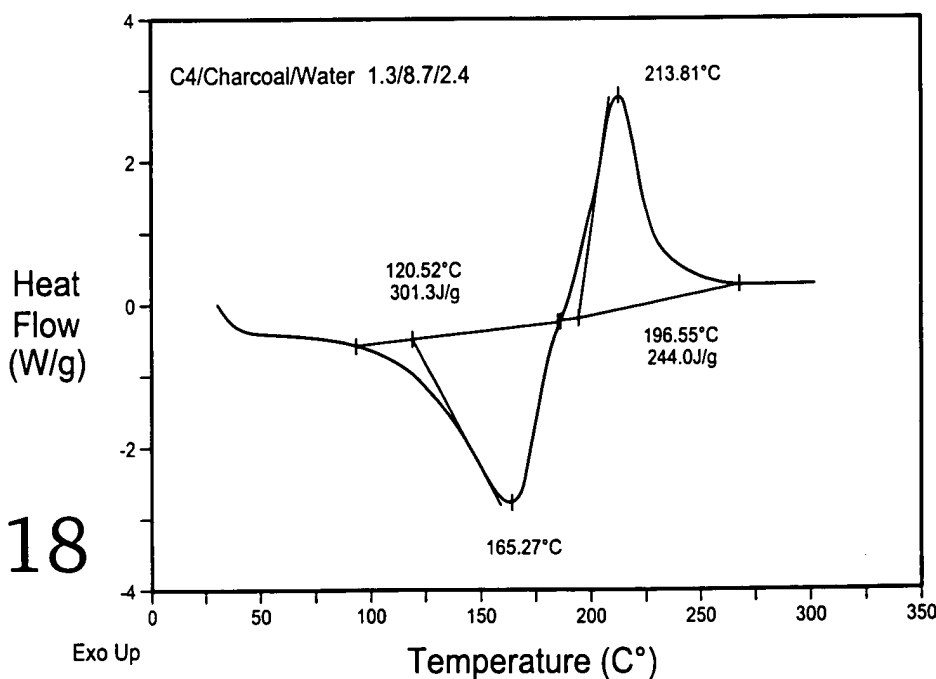
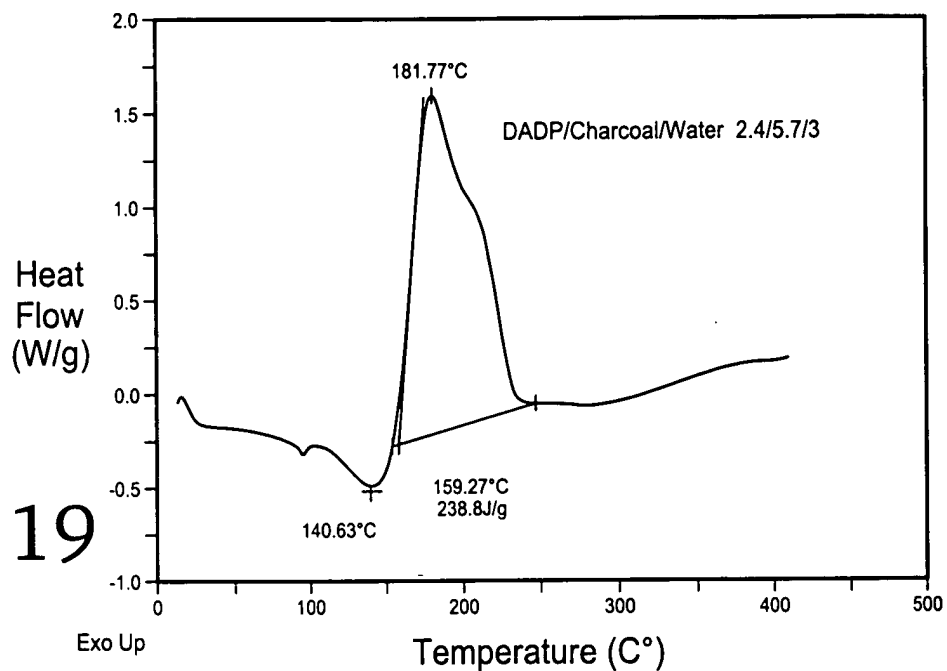


FIG. 18

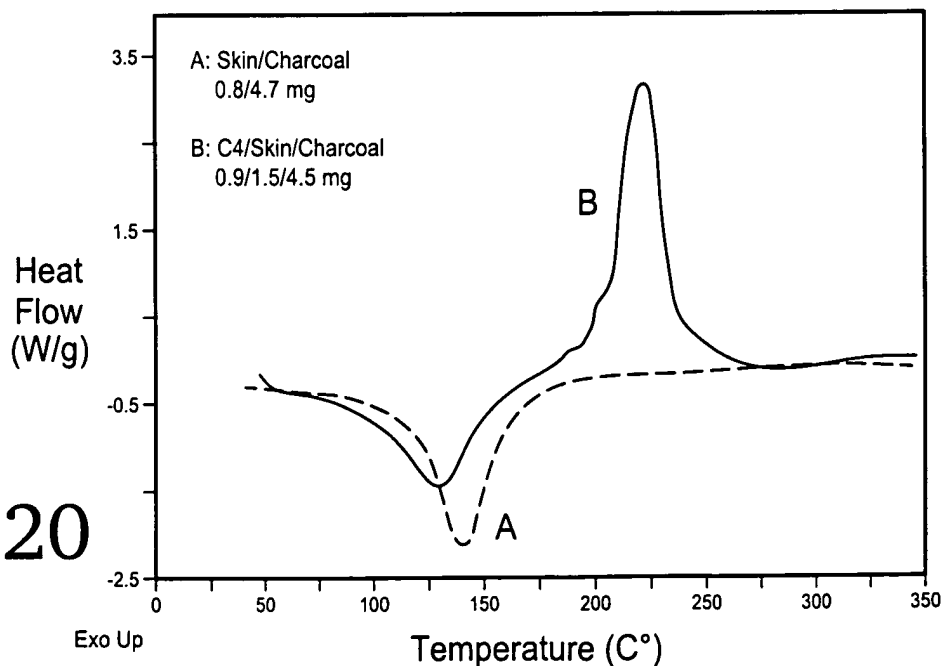
DSC thermogram of C4/Water/Charcoal, sample weight is 12.3 mg

FIG. 19



DSC thermogram of DADP/Water/Charcoal, sample weight is 11.1 mg

FIG. 20

DSC thermogram for Charcoal/Skin Fragments, and for
Charcoal/Skin/C4 mixture

Applicant(s): William A. Curby et al.

THE ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: RDX from CHCL

Size: 0.0000 mg

Method: 25°C to 300°C @ 5 C/s

Comment: 232-3; 5 C/s; endo up; bk sub

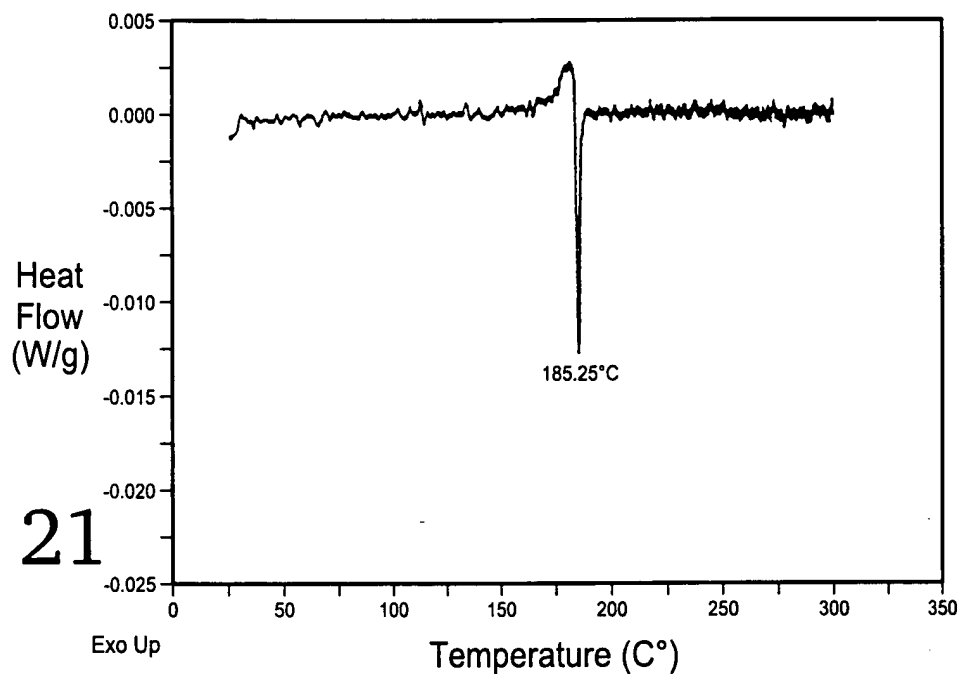
 μ TA

FIG. 21

Sample: TATP

Size: 0.0000 mg

Method: 25.000°C to 301.000°C @ 5

Comment: 232-3; 5 C/s; endo up; bk sub

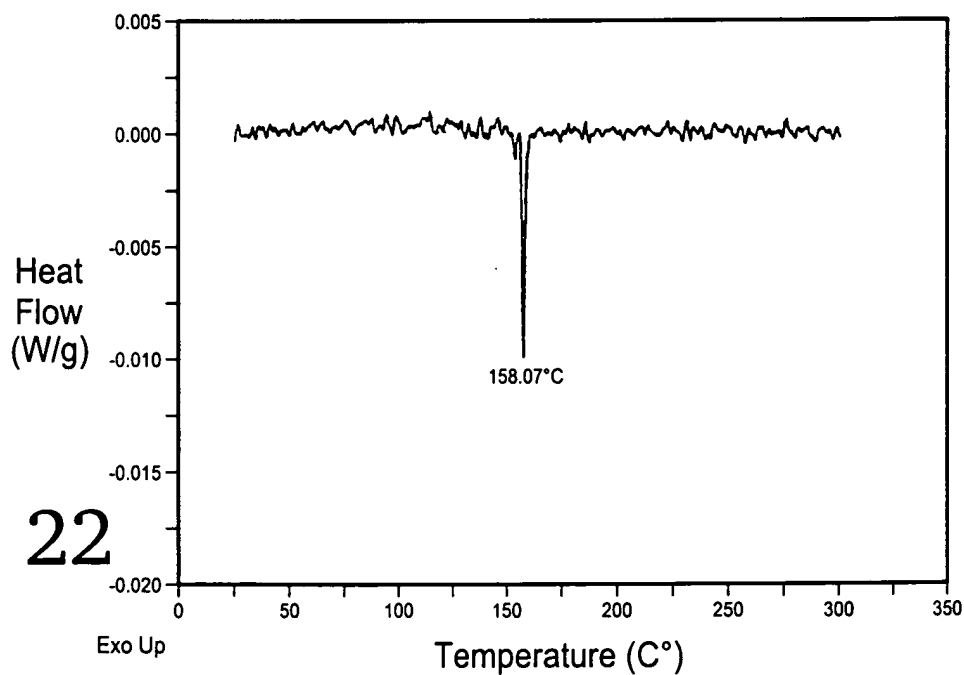
 μ TA

FIG. 22

Analyst(s): William A. Curby et al.

THERMAL ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: HMTD

Size: 0.0000 mg

Method: 25°C to 300°C @ 5 C/s

Comment: 232-3; 5 C/s; endo dn; bk sub

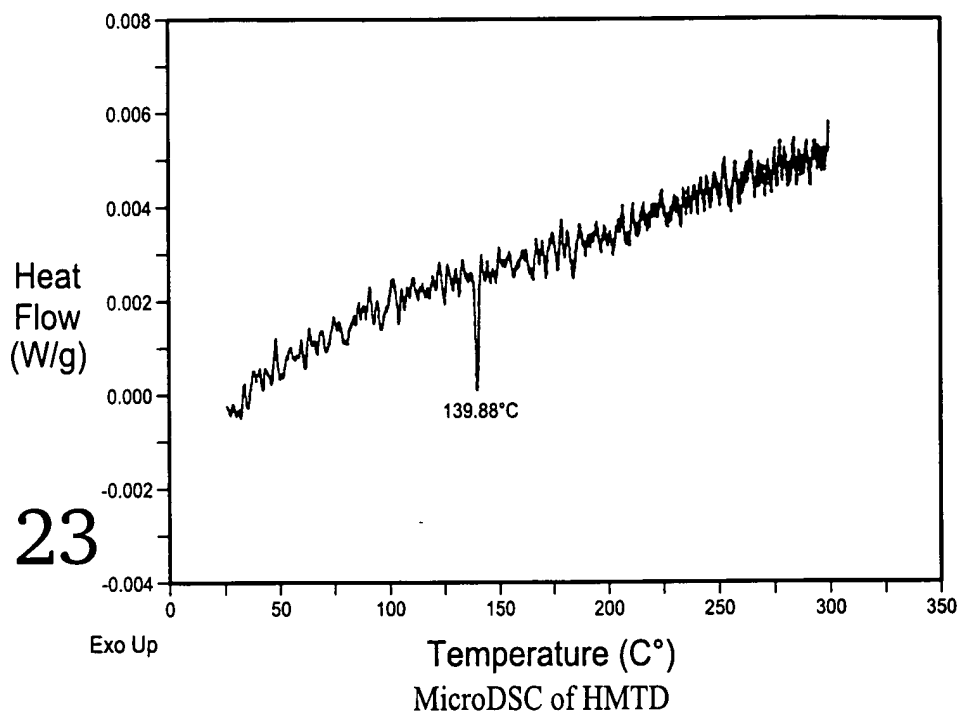
 μ TA

FIG. 23

Sample: RDX from CHCL

Size: 0.0000 mg

Method: 25°C to 300°C @ 25 C/s

Comment: 232-3; 5 C/s; endo up; bk sub

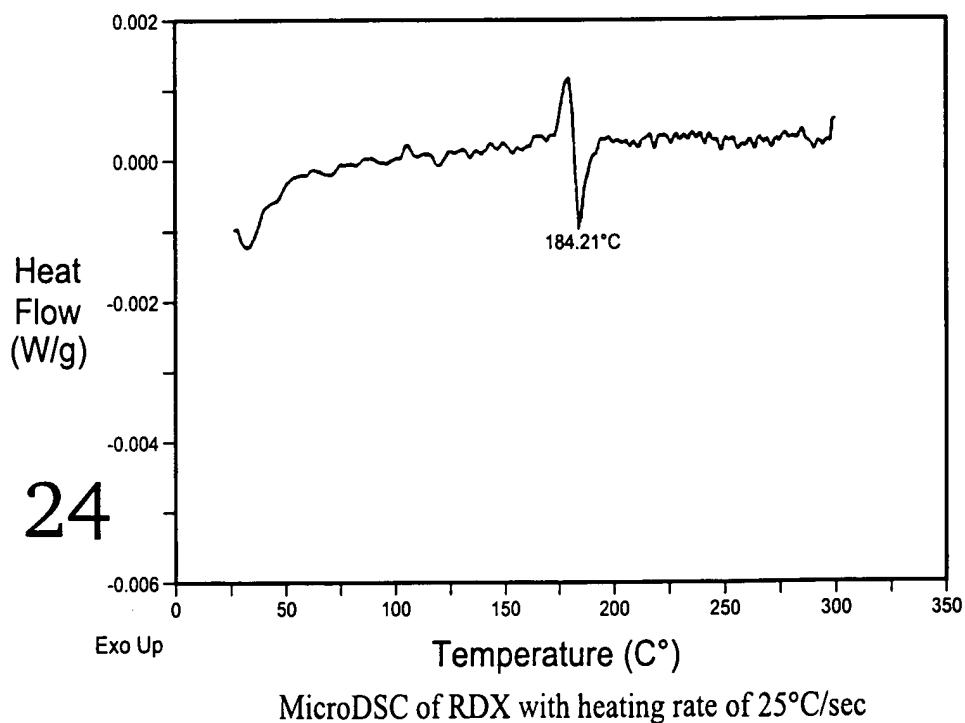
 μ TA

FIG. 24

Applicant(s): William A. Curby et al.
 THERMAL ANALYSIS FOR DETECTION AND
 IDENTIFICATION OF EXPLOSIVES AND OTHER
 CONTROLLED SUBSTANCES

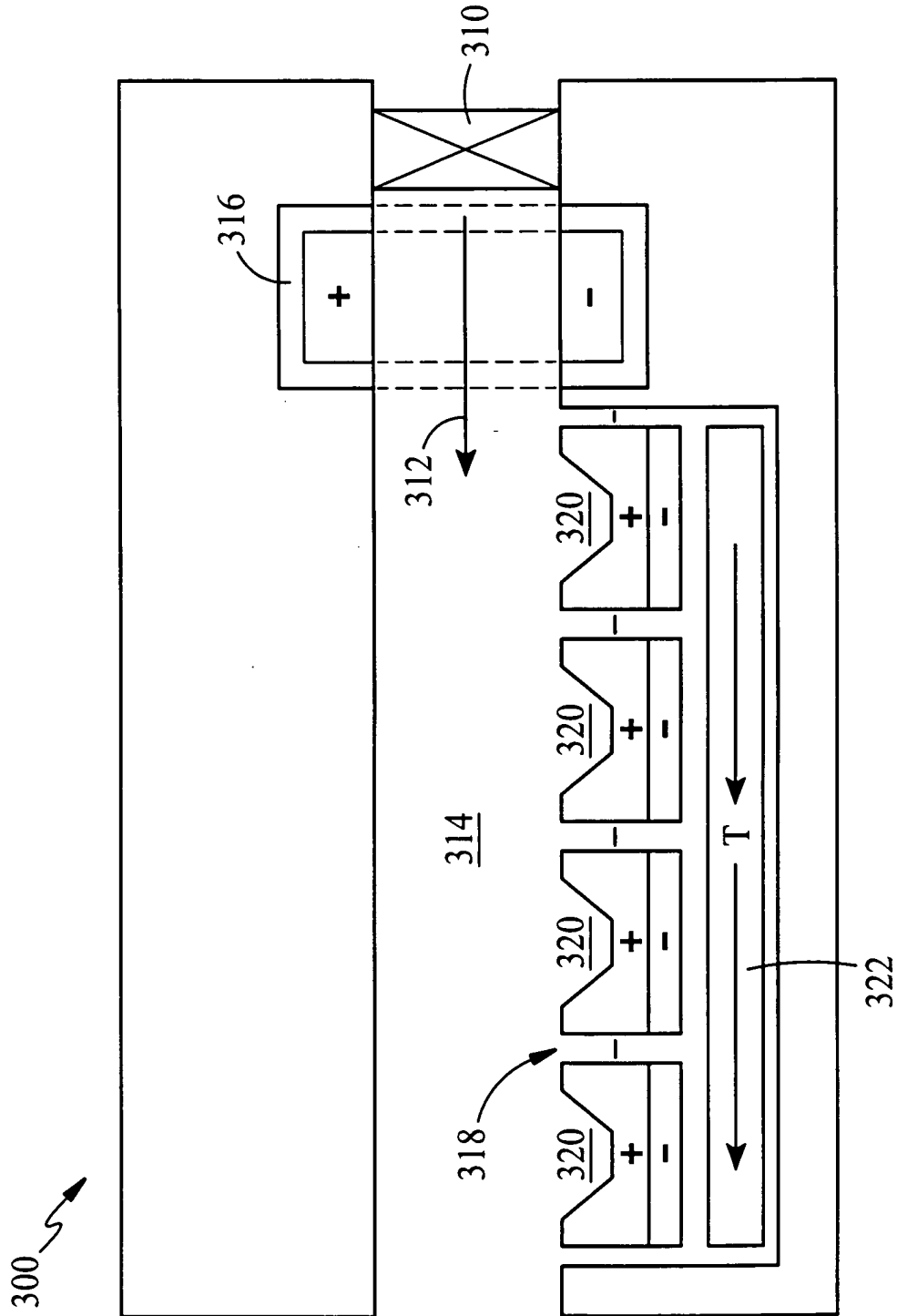


FIG. 25

Investigator(s): William A. Curby et al.
THERMAL ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: Sugar
Size: 0.071 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

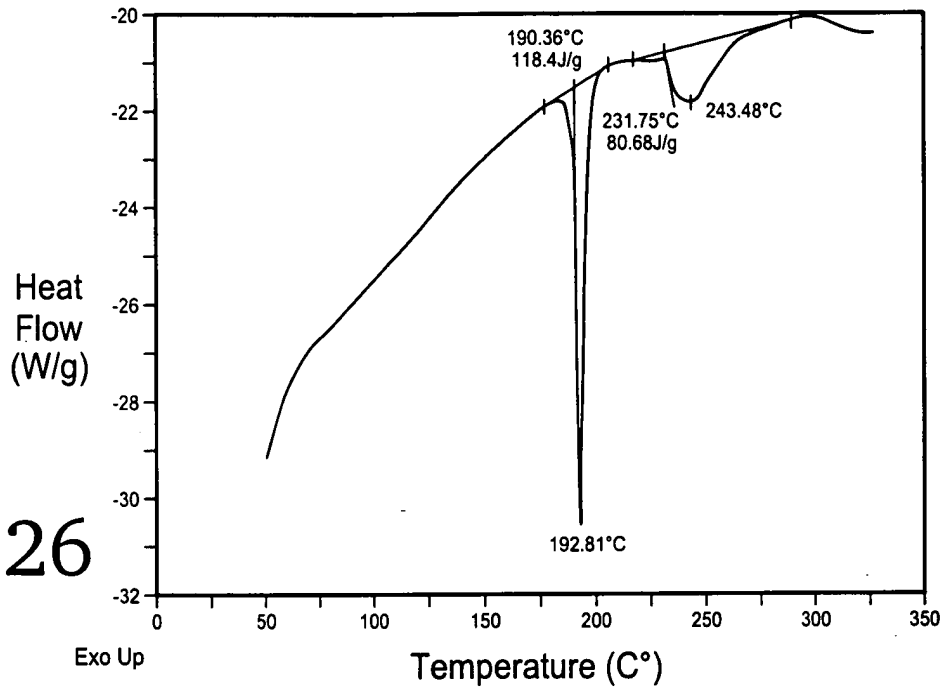


FIG. 26

DSC thermogram of Sugar, sample weight is 0.071 mg

Sample: UMass Caffeine
Size: 0.9040 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

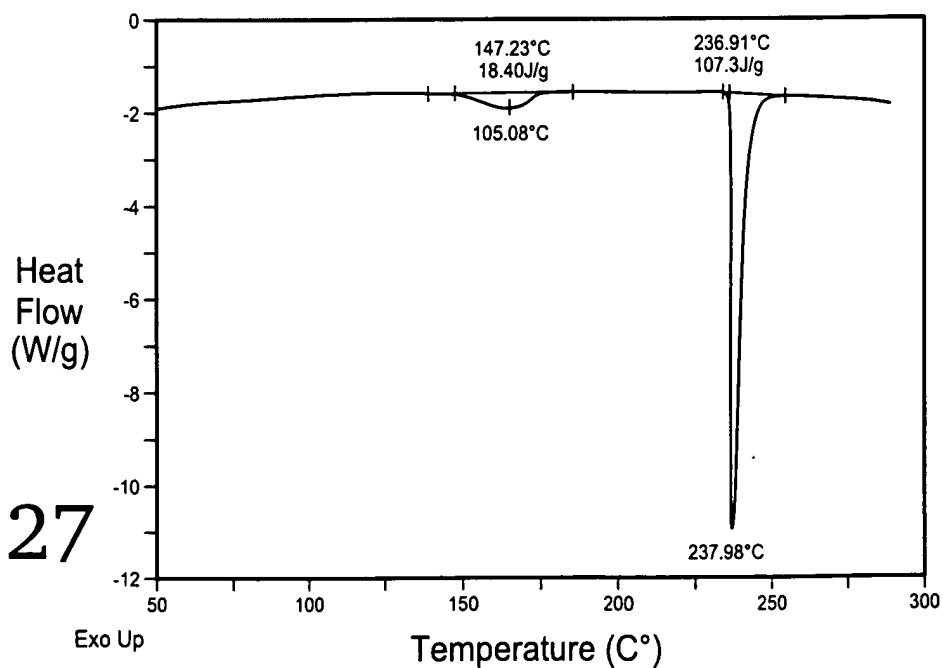


FIG. 27

DSC thermogram of caffeine, a non-explosive, sample weight is 0.904 mg

Sample: UMass Bupivacaine
Size: 0.3120 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

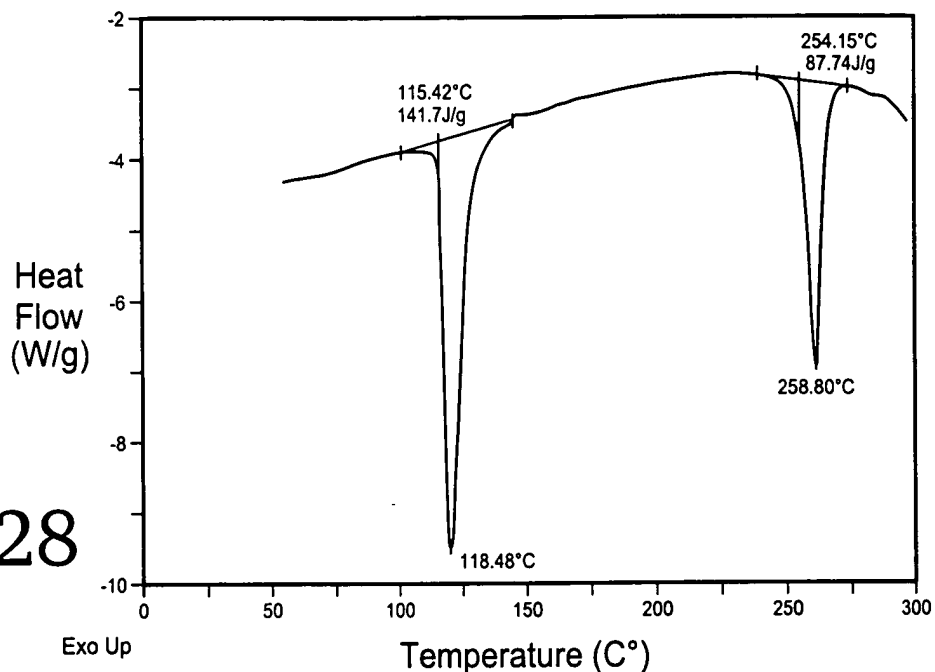


FIG. 28

Sample: UMass Tetracaine
Size: 0.5810 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC

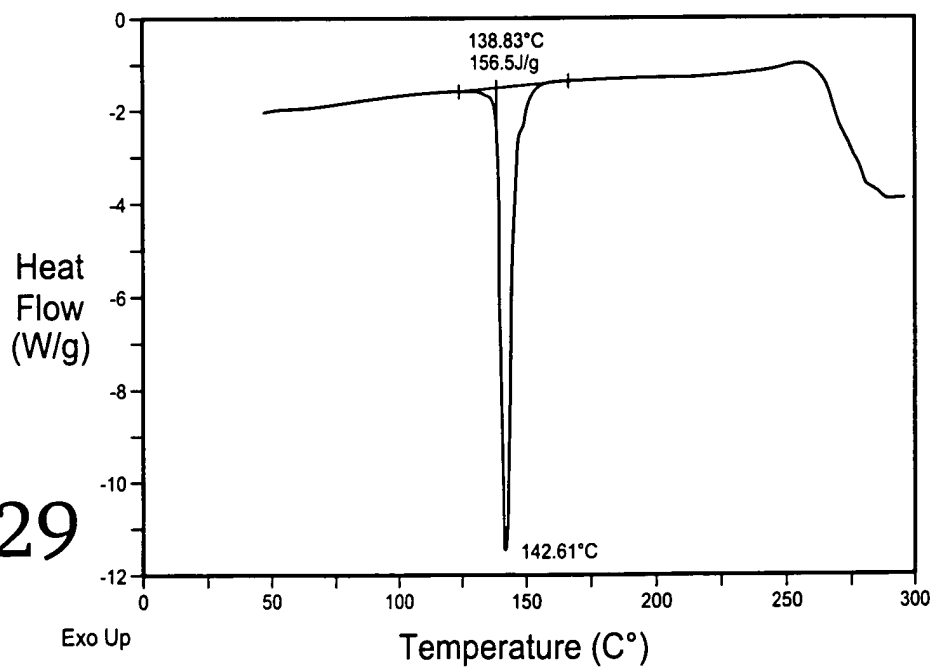


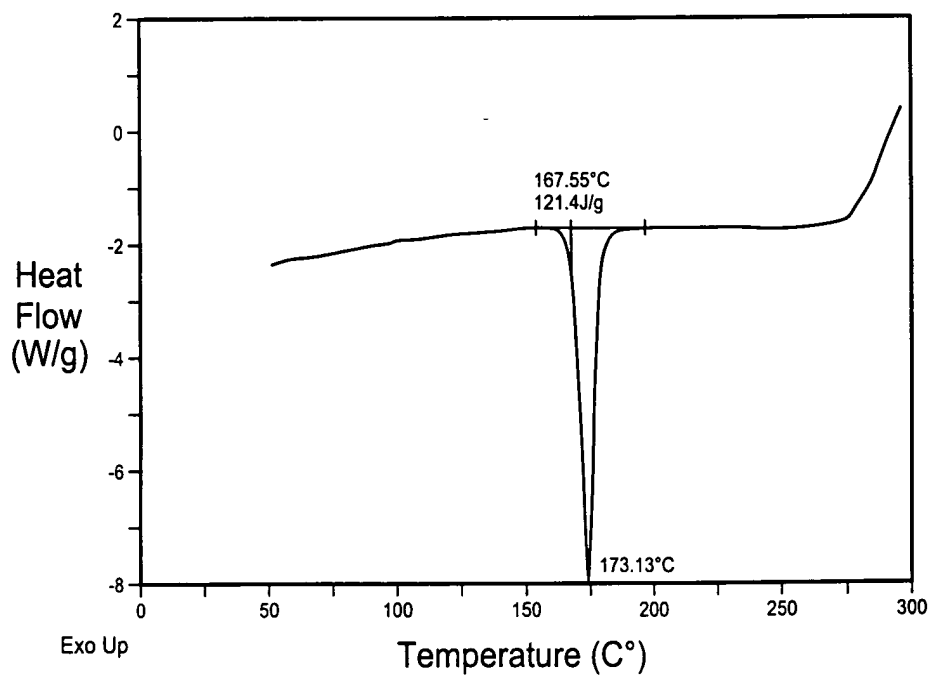
FIG. 29

Applicant(s): William A. Curby et al.

THERMAL ANALYSIS FOR DETECTION AND
IDENTIFICATION OF EXPLOSIVES AND OTHER
CONTROLLED SUBSTANCES

Sample: UMass Prilocaine
Size: 0.4400 mg
Method: 20°C/min
Comment: N2=50 mL/min

DSC



DSC thermogram of Prilocaine, sample weight is 0.44 mg

FIG. 30